

30 °F (-1 °C) during vehicle preconditioning, except for preconditioning performed in accordance with § 86.232(a)(7), and during all emission testing.

(2) The ambient temperature reported shall be a simple average of the test cell temperatures measured at constant intervals no more than one minute apart. Before the driving cycle may begin, the test cell temperature shall be 20 °F±3 °F (-7 °C±1.7 °C) when measured in accordance with paragraph (e)(2) of this section. The temperature may not exceed 25 °F (-4 °C) or fall below 15 °F (-9 °C) for more than three consecutive minutes during the test.

(d) *Vehicle positioning.* The vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution.

(e) *Engine compartment cooling.* (1) Fixed speed air cooling of the engine compartment with the compartment cover open shall be utilized during testing that is conducted by the Administrator and, optionally for certification testing, by the manufacturer. If a separate movable fan is used, it shall be squarely positioned within 12 inches (30.5 centimeters) of the front of vehicles with front engine compartments. In the case of vehicles with rear engine compartments (or if special designs make the normal front engine positioning impractical), the cooling fan shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 5,300 cfm (2.50 cubic meters per second). If, however, the manufacturer showed (as provided in § 86.135-94(b)) that additional cooling is necessary, the fan capacity may be increased or additional fans used if approved in advance by the Administrator. The cooling air temperature shall be measured at the inlet to the fan.

(2) In lieu of using a separate fan, an air handling system that is integral with the test cell may be used provided comparable air movement is obtained. The cooling air temperature shall be measured in the center of a vertical plane that is located approximately 2 feet in front of the vehicle.

(3) The manufacturer may use, for certification testing, alternative en-

gine compartment cooling fans or systems, including those which provide a variable air flow, if the manufacturer has determined that comparable results are obtained.

(f) *Heater and defroster usage.* The heater and defroster may be used at any temperature and fan settings.

§ 86.231-94 Vehicle preparation.

The provisions of § 86.131-90 apply to this subpart.

§ 86.232-94 Vehicle preconditioning.

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be filled to approximately the prescribed "tank fuel volume" with the test fuel specified § 86.213. If the existing fuel in the fuel tank(s) does not meet the specifications contained in § 86.213, the existing fuel must be drained prior to the fuel fill. The test fuel shall be at a temperature less than or equal to 60 °F. For the operations in this paragraph (a)(1), the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) For operation on a 48-inch (1.22 metre) diameter single roll dynamometer, the drive wheel tires shall be inflated to the pressure recommended by the tire manufacturer. For operation on a twin-roll dynamometer, the drive wheel tires may be inflated to a gauge pressure of 40 psi (276 kPa). The drive wheel tire pressures shall be reported with the test results.

(3) The fuel in the vehicle shall be stabilized at 20 °F±10 °F (-7 °C±5.6 °C) prior to the start of the driving cycle except when vehicle preconditioning is performed in accordance with paragraph (a)(7) of this section.

(4) The vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one UDDS cycle.

(5) For those unusual circumstances where additional preconditioning is desired by the manufacturer, such preconditioning may be allowed with the advance approval of the Administrator.

(6) The Administrator may also choose to conduct additional preconditioning. The additional preconditioning shall consist of one or more

driving cycles of the UDDS, as described in paragraph (a)(4) of this section.

(7) The manufacturer may, for certification testing, precondition vehicles at temperatures above 20 °F (−7 °C) and with temperature tolerances greater than those specified in §86.230(a) if the manufacturer has determined that such preconditioning does not decrease CO emissions during the testing specified in §86.237.

(b) Within five minutes of completion of preconditioning, the vehicle shall be shut off. During this five minute period, the vehicle shall not experience ambient temperatures less than 10 °F (−12 °C) nor more than 30 °F (−1 °C).

(c) One of the following two methods shall be utilized to stabilize the vehicle before the emissions test:

(1) *Storing at cold temperatures.* The vehicle shall be stored for not less than 12 hours nor for more than 36 hours prior to the cold start exhaust test. The ambient temperature (dry bulb) during this period shall be maintained at an average temperature of 20 °F±5 °F (−7 °C±2.8 °C) during each hour of this period and shall not be less than 10 °F (−12 °C) nor more than 30 °F (−1 °C). The ambient temperature reported shall be a simple average of the test cell temperature measured at constant intervals no more than one minute apart. In addition, the temperature may not exceed 25 °F (−4 °C) or fall below 15 °F (−9 °C) for more than three consecutive minutes.

(2) *Force-cooling or warming.* (i) The vehicle shall be stored for no more than 36 hours prior to cooling or warming for the cold start exhaust test. The vehicle shall not be stored at ambient temperatures which exceed 86 °F (30 °C) during this period.

(ii) Vehicle cooling may be accomplished by either force-cooling or force-warming the vehicle to the test temperature. If cooling is augmented by fans, the fans shall be placed in a vertical position for maximum drive train and engine cooling, not primarily oil pan cooling. Fans shall not be placed under the vehicle.

(iii) The ambient temperature need only be stringently controlled after the vehicle has been cooled to 20 °F±3 °F (−7 °C±1.7 °C), as determined by a rep-

resentative bulk oil temperature. A representative bulk oil temperature is the temperature of the oil measured near the middle of the oil, not at the surface or at the bottom of the oil pan. If two or more diverse locations in the oil are monitored, they must all meet the temperature requirements.

(iv) The vehicle must be stored for at least one hour after it has been cooled to 20 °F±3 °F (−7 °C±1.7 °C) prior to the cold start exhaust test. The ambient temperature (dry bulb) during this period shall average 20 °F±5 °F (−7 °C±2.8 °C) and shall not be less than 10 °F (−12 °C) nor more than 30 °F (−1 °C). In addition, the temperature may not exceed 25 °F (−4 °C) or fall below 15 °F (−9 °C) for more than three consecutive minutes.

(d) If the vehicle is stabilized at 20 °F (−7 °C) in a separate area and is moved through a warm area to the test cell, the vehicle must be restabilized in the test cell for at least six times the period the vehicle is exposed to warmer temperatures. The ambient temperature (dry bulb) during this period shall average 20 °F±5 °F (−7 °C±2.8 °C) and shall not be less than 10 °F (−12 °C) nor more than 30 °F (−1 °C). In addition, the temperature may not exceed 25 °F (−4 °C) or fall below 15 °F (−9 °C) for more than three consecutive minutes. The maximum time for moving a vehicle through a warm area shall be 10 minutes.

§§ 86.233-94—86.234-94 [Reserved]

§ 86.235-94 Dynamometer procedure.

(a) *Overview.* The emission sampling is completed over two test sequences, a “cold” start test after a minimum 12-hour and a maximum 36-hour soak according to the provisions of §86.232 and a “hot” start test following the “cold” start test by 10 minutes. Engine start-up, operation over the UDDS, and engine shut-down make a complete cold start test. Engine startup and operation over the first 505 seconds of the driving schedule complete the hot start test. The exhaust emissions are diluted with ambient air and a continuously proportional sample is collected for analysis during each phase. The composite samples collected in bags are analyzed for hydrocarbons, carbon